S. longisetus Sp. nov.

Festuca macrostachya Torr. & Gray, U.S. Rept. Expl. Miss. Pacific 2 (4):177. 1855, name only, based on a staminate specimen from Pecos, Texas.

Perenne, monoica, planta erecta, 1 - 2 dm alta, e basi decumbentes; caespitosa sed etiam stoloniferum cum internodiis 5 - 15 cm longiores; laminae basi, planae, 1 - 2 mm latae, 1 - 2 cm longae, terminae acuminae; Paniculae cum ramis adscendentibus vel poco divergentibus con spiculae appressae; panicula supra laminae; aliquis plantas appare dioica sed alius spiculis masculis et feminis in eadem inflorescentia depositis; spiculae masculae 2 - plures - florae, 2 - 3 cm longae; glumae aequans; spiculae feminina 1 - plures - florae, 2.5 - 3 cm longae; lemmata prima cum callo barbata, acuta, cum aristas 5 - 15 cm longa, torcida.

Perennial, monoecious, the plants 1 - 2 dm tall, loosely tufted but producing wiry stolons with internodes 5 to 15 cm long; leaves basal, the blades flat, 1 to 2 mm wide, 1 - 2 cm long, sharp-pointed.

Spikelets on short appressed pedicels, the panicle well exserted above the leaves; some plants appearing to be dioecious but others with male and female florets in the same inflorescence; male spikelets several flowered, 2 - 3 cm long, the rachilla not disarticulating; glumes about equal, nearly as long as the first lemma; female spikelets one to several-flowered, 2.5 - 3 cm long, disarticulation above the glumes, the florets falling together, the lowest floret with a sharp, bearded callus, the awns 5 - 15 cm long, twisted but not strongly recurved.

Type: Mexico, Coahuila, 28 mi. s. of Saltillo, Sept. 5, 1963, Reeder and Reeder 3626.

This species is found on semiarid plains and poorly drained bottomlands in southern Colorado, Arizona (Gooding 179-47), New Mexico (Beetle 6204) and Texas (Beetle 14922) as well as the states of Sonora, Chihuahua (Pringle 484), Zacatecas (Reeder and Reeder 4713), Coahuila (Reeder and Reeder 3641), Durango, and San Luis Potosi (Reeder and Reeder 4060 and 2938) in noerthern Mexico.

This is not an important range grass although it may serve some purpose in erosion control. Long ago Griffiths proclaimed "It is difficult to conceive of stock being driven to such an extremity as to eat this species" (cf Griffiths, D. 1915. Native pasture grasses of the United States. U.S.D.A. Bull. 201:1 - 52.). The sharp callus penetrates wool with ease. It is commonly called burrograss or "zacate del burro". The distribution patterns of the two species apparently do not overlap although both species have been reported from the state of San Luis Potosi in Mexico.

S. brevifolius is always dioecious, the male and female plants being separate. S. longisetus may appear to be dioecious but apparently all populations have the potential to be monoecious and many such monoecious collections with male and female spikelets in the same inflorescence have been made.

S. brevifolius is essentially a matforming plant with freely branching rhizomes. On the otherhand S. longisetus forms elongate stolons, some leaves forming on the aerial nodes even when not in contact with the ground. There is great variation in the size of the awns found on the female spikelets (5 - 15 cm) of S. longisetus. On the other hand the size of the awns of S. brevifolius is very uniform (3 - 5 cm long).Based on Reeder and Reeder 4607 from Chihuahua, Mexico, the chromosome count, 2 n equals 40, for longisetus, is the same as that for S. brevifolius (cf Reeder,J.R.1967 and 1968. Notes on Mexican grasses VI and VIII. Bull Torrey Botanical Club).

NEW COMBINATIONS IN THE GENUS PACKERA (Asteraceae)

W. A. Weber & Áskell Löve

Of all the collective genera of Bentham and Hooker (1873) and their followers, few are as diverse in habits and habitats as Senecio, a group that, in its strict sense, based on the annual type species S. vulgaris L., is small and clearly defined. Recent estimates of the aggregation suggest that Senecio, sens. latiss., comprises at least a thousand species (Barkley 1978), or 2-3,000 species (Shaw in Willis 1966), or about 3,000 species (Nordenstam 1978b). The genus, as still commonly circumscribed, is a taxonomical potpourri of unusual dimensions.

It is understandable that no one has ventured into a general revision of the senecioid complex, since a thorough study worldwide would require the concerted efforts of a team with numerous skills beyond those of the individual taxonomist. Nevertheless, a few courageous botanists recently have taken a fresh look at parts of the genus, with some success, notably Kirpicznikov (1961) for the taxa met with in the Soviet Union, Nordenstam (1978a,b) basing his studies on morphological and some chemical characteristics of mainly Old World representatives, and Barkley (1978) who studied the North American species. The revisions resulting from these studies are only the first hesitant steps toward a long series of treatments that ultimately may result in a taxonomic division of the immense array of variation into a larger number of biologically well-defined genera.

Although most groups traditionally circumscribed within Senecio seem to be cytologically uninteresting, observations on chromosome numbers have revealed that, whereas the majority of taxa are characterized by the basic number x=10, as in Senecio proper, there are some deviations in basic number that are correlated with morphological trends given sectional rank. This observation has been employed in part in the classification proposed by Nordenstam (1978a) and in the division of Arctic representatives (Löve & Löve 1975, 1976), including the arctic-boreal genus Tephroseris with its basic number x=8 and typically absent outer phyllaries, and the mainly New World genus Packera, consisting of most of the Aurei, Lobati and Tomentosi of Rydberg (1900) and Greenman (1916, 1918), characterized by prolonged rhizomes, distinctive basal/cauline leaf arrangement and form, and characteristic tomentum whenever present. Most of the species of Tephroseris were transferred to it by Holub (1973), but only those species of Packera reaching the Arctic were transferred by Löve & Löve (1976).

Our preliminary observations of other North American representatives of the Senecio complex indicated that some genera

recognized as distinct by Eurasiatic botanists also ought to be given that status on this continent--notably Ligularia (including Cremanthodium). Nordenstam (corresp.), Barkley (corresp.) and Robinson (1979) insist that Weber (1973) transferred the American species to this genus incorrectly, for the floral anatomy of Ligularia is cacalioid and that of the American species (Senecio, Amplectentes) is senecioid. The transfer was made on gross morphological grounds, and while admittedly it does not fit in with current concepts, the fact remains that an alpine senecioid group of the Rocky Mountains resembles the Asiatic genus so closely as to demonstrate a classic example of convergent evolution. If not at home in Ligularia, this group stands as a monophyletic line among American senecionids and deserves generic rank. We are inclined to feel that ultimately several new genera will need to be described in order to accommodate the discrete patterns of morphology which characterize several other American Senecio groups, notably the Suffruticosi and the Triangulares.

In this paper we want to complete the process of transferring to Packera those North American taxa for which there is reasonable morphologic and/or cytological evidence. The morphological evidence on which these transfers are based was reviewed by Barkley (1978), but the cytological support for the distinctness of the genus has been confirmed for various species by Sokolovskaya & Strelkova (1938, 1948), Turner, Powell & King (1962), Wiens & Halleck (1962), Ornduff, Raven, Kyhos & Kruckeberg (1963), Palmblad (1965), Taylor & Brockman (1966), Ornduff, Mosquin, Kyhos & Raven (1967), Johnson & Packer (1968), Taylor & Mulligan (1968), Lee (1969), Packer (1972), Ward (in Love 1981) and Löve & Löve (unpubl.).

PACKERA ACTINELLA (Greene) Weber & Löve, comb. nov. Senecio actinella Greene, Bull. Torr. Bot. Club 10:87. 1883.

PACKERA ANONYMA (Wood) Weber & Löve, comb. nov. Senecio anonymus Wood, Class-book, 464. ed. of 1861.

PACKERA ANTENNARIIFOLIA (Britton) Weber & Löve, comb. nov. Senecio antennariifolius Britton in Britton & Brown, Illus. Fl. 3:478. 1898.

PACKERA BELLIDIFOLIA (H.B.K.) Weber & Löve, comb. nov. Senecio belidifolius H.B.K., Nov. Gen. Sp. 4:175. 1820.

PACKERA BERNARDINA (Greene) Weber & Löve, comb. nov. Senecio bernardinus Greene, Pittonia 3:298. 1898.

PACKERA BOLANDERI (A. Gray) Weber & Löve, comb. nov. Senecio bolanderi A. Gray, Proc. Am. Acad. Arts Sci. 7:362. 1868.

PACKERA BREWERI (Davy) Weber & Löve, comb. nov. Senecio breweri Davy, Erythea 3:116. 1895.

PACKERA CANA (Hook.) Weber & Löve, comb. nov. Senecio canus Hook., Fl. Bor.-Am. 1:333. pl. 116. 1834.

PACKERA CANA f. ERADIATA (D. C. Eaton) Weber & Löve, comb. nov. Senecio canus D. C. Eaton in S. Wats., Bot. King's Exped. 190. 1871.

PACKERA CANDIDISSIMA (Greene) Weber & Löve, comb. nov. Senecio candidissumus Greene, Pittonia 4:110. 1900.

PACKERA CARDAMINE (Greene) Weber & Löve, comb. nov. Senecio cardamine Greene, Bull. Torrey Bot. Club 8:98. 1881.

PACKERA CLEVELANDII (Greene) Weber & Löve, comb. nov. Senecio clevelandii Greene, Bull. Torrey Bot. Club 10:87. 1883.

PACKERA CROCATA (Rydb.) Weber & Löve, comb. nov. Senecio crocatus Rydb., Bull. Torrey Bot. Club 24:299. 1897.

PACKERA CYMBALARIA (Pursh) Weber & Löve, comb. nov. Senecio cymbalaria Pursh, Fl. Am. Sept. 2:530. 1814.

PACKERA CYMBALARIOIDES (Nutt.) Weber & Löve, comb. nov. Senecio cymbalarioides Nutt., Trans. Am. Phil. Soc. II,7:412. 1841.

PACKERA CYNTHIOIDES (Greene) Weber & Löve, comb. nov. Senecio cynthioides Greene, Leaflets 1:212. 1906.

PACKERA DEBILIS (Nutt.) Weber & Löve, comb. nov. Senecio debilis Nutt., Trans. Am. Phil. Soc. II,7:408. 1841.

PACKERA DIMORPHOPHYLLA (Greene) Weber & Löve, comb. nov. Senecio dimorphophyllus Greene, Pittonia 4:109. 1900.

PACKERA DIMORPHOPHYLLA ssp. INTERMEDIA (T. M. Barkley) Weber & Löve, comb. nov. Senecio dimorphophyllus ssp. intermedius T. M. Barkley, Trans. Kans. Acad. 65:362. 1963.

PACKERA EURYCEPHALA (T. & G.) Weber & Löve, comb. nov. Senecio eurycephalus T. & G., Mem. Amer. Acad. II,4:109. 1849.

PACKERA FENDLERI (A. Gray) Weber & Löve, comb. nov. Senecio fendleri A. Gray, Mem. Am. Acad. II,4:108. 1849.

PACKERA FLETTII (Wiegand) Weber & Löve, comb. nov. Senecio flettii Wiegand, Bull. Torrey Bot. Club 26:137. 1899.

PACKERA FRANCISCANA (Greene) Weber & Löve, comb. nov. Senecio franciscanus Greene, Pittonia 2:19. 1889.

PACKERA GANDERI (Barkley & Beauchamp) Weber & Löve, comb. nov. Senecio ganderi Barkley & Beauchamp, Brittonia 26:106. 1974.

PACKERA GREENEI (A. Gray) Weber & Löve, comb. nov. Senecio greenei A. Gray, Proc. Am. Acad. Arts Sci. 10:75. 1874.

PACKERA HARTIANA (Heller) Weber & Löve, comb. nov. Senecio hartianus Heller, Bull. Torrey Bot. Club 26:622. 1899.

PACKERA HESPERIA (Greene) Weber & Löve, comb. nov. Senecio hesperius Greene, Pittonia 2:166. 1891.

PACKERA IONOPHYLLA (Greene) Weber & Löve, comb. nov. Senecio ionophyllus Greene, Pittonia 2:20. 1889.

PACKERA LAYNEAE (Greene) Weber & Löve, comb. nov. Senecio layneae Bull. Torrey Bot. Club 10:87. 1883.

PACKERA LORATIFOLIA (Greenman) Weber & Löve, comb. nov. Senecio loratifolius Greenman, Proc. Amer. Acad. Arts Sci. 43:21. 1907.

PACKERA MACOUNII (Greene) Weber & Löve, comb. nov. Senecio macounii Greene, Pittonia 3:169. 1897.

PACKERA MILLEFOLIA (T. & G.) Weber & Löve, comb. nov. Senecio millefolium T. & G., Fl. N. Am. 2:444. 1843.

PACKERA MILLELOBATA (Rydb.) Weber & Löve, comb. nov. Senecio millelobatus Rydb., Bull. Torrey Bot. Club 27:171. 1900.

PACKERA MULTILOBATA (T. & G. ex A. Gray) Weber & Löve, comb. nov. Senecio multilobatus T. & G. ex A. Gray, Mem. Amer. Acad. Arts Sci. II,4:109. 1849 (Pl. Fendlerianae).

PACKERA NEOMEXICANA (A. Gray) Weber & Löve, comb. nov. Senecio werneriaefolius A. Gray, Syn. Fl. N. Am. 1(2):392. 1884.

PACKERA NEOMEXICANA var. MUTABILIS (Greene) Weber & Löve, comb. nov. Senecio mutabilis Greene, Pittonia 4:113. 1900.

PACKERA NEWCOMBEI (Greene) Weber & Löve, comb. nov. Senecio newcombei Greene, Pittonia 3:249. 1897.

PACKERA OBOVATA (Muehl. ex Willd.) Weber & Löve, comb. nov. Senecio obovatus Muehl. ex Willd., Sp. Pl. 3:199. 1804.

PACKERA PLATTENSIS (Nutt.) Weber & Löve, comb. nov. Senecio plattensis Nutt., Trans. Am. Phil. Soc. II,7:413. 1841.

PACKERA PSEUDAUREA (Rydb.) Weber & Löve, comb. nov. Senecio pseudaureus Rydb., Bull. Torrey Bot. Club 24:208. 1897.

PACKERA PSEUDAUREA ssp. FLAVULA (Greene) Weber & Löve, comb. nov. Senecio flavulus Greene, Pittonia 4:108. 1900.

PACKERA QUAERENS (Greene) Weber & Löve, comb. nov. Senecio quaerens Greene, Leaflets 1:214. 1906.

PACKERA QUEBRADENSIS (Greenman) Weber & Löve, comb. nov. Senecio quebradensis Greenman, Ann. Missouri Bot. Gard. 3:117. 1916.

PACKERA ROSEI (Greenman) Weber & Löve, comb. nov. Senecio rosei Greenman, Monogr. Senecio, I. Teil, 24. 1901.

PACKERA SANGUISORBOIDES (Rydb.) Weber & Löve, comb. nov. Senecio sanguisorboides Rydb., Bull. Torrey Bot. Club 27:170. 1900.

PACKERA SCHWEINITZIANA (Nutt.) Weber & Löve, comb. nov. Senecio schweinitzianus Nutt., Trans. Am. Phil. Soc. II. 7:413. 1941.

PACKERA STREPTANTHIFOLIA (Greene) Weber & Löve, comb. nov. Senecio streptanthifolius Greene, Erythea 3:23. 1895.

PACKERA TOLUCCANA (DC.) Weber & Löve, comb. nov. Senecio toluccanus DC., Prodr. 6:428. 1837.

PACKERA TRIDENTICULATA (Rydb.) Weber & Löve, comb. nov. Senecio tridenticulatus Rydb., Bull. Torrey Bot. Club 27:175. 1900.

PACKERA UMBRACULIFERA (S. Wats.) Weber & Löve, comb. nov. Senecio umbraculifer S. Wats., Proc. Amer. Acad Arts Sci. 23:279. 1888.

PACKERA WERNERIAEFOLIA (A. Gray) Weber & Löve, comb. nov. Senecio werneriaefolius A. Gray, Proc. Am. Acad. Arts Sci. 19:54. 1883.

BIBLIOGRAPHY

BARKLEY, T. M. 1978. Senecio. North American Flora, Ser. II, Part 10:50-139.

BENTHAM, G. & HOOKER, J. D. 1873. Genera Plantarum 2. London.

GREENMAN, J. M. 1916. Monograph of the North and Central American species of the genus Senecio. Part II, Sect. 6. Aurei Rydb. Ann. Missouri Bot. Garden 3:85-194. Pl. 3-5.